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Playing In or Out of Character: User Role Differences in the Experience of Interactive Storytelling

Christian Roth, M.Sc.,¹ Ivar Vermeulen, Ph.D.,² Peter Vorderer, Ph.D.,³ Christoph Klimmt, Ph.D.,⁴
David Pizzi, Ph.D.,⁵ Jean-Luc Lugin, Ph.D.,⁵ and Marc Cavazza, Ph.D.⁴

Abstract

Interactive storytelling (IS) is a promising new entertainment technology synthesizing preauthored narrative with dynamic user interaction. Existing IS prototypes employ different modes to involve users in a story, ranging from individual avatar control to comprehensive control over the virtual environment. The current experiment tested whether different player modes (exerting local vs. global influence) yield different user experiences (e.g., senses of immersion vs. control). A within-subject design involved 34 participants playing the cinematic IS drama "Emo Emma"¹ both in the local (actor) and in global (ghost) mode. The latter mode allowed free movement in the virtual environment and hidden influence on characters, objects, and story development. As expected, control-related experiential qualities (effectance, autonomy, flow, and pride) were more intense for players in the global (ghost) mode. Immersion-related experiences did not differ over modes. Additionally, men preferred the sense of command facilitated by the ghost mode, whereas women preferred the sense of involvement facilitated by the actor mode.

Introduction

COMPUTER-BASED ENTERTAINMENT technologies are remarkably popular all over the world. While certain video games such as triple-A shooter or role-playing games represent the state of the art in computer-based entertainment technology and dominate markets worldwide, a great breadth of alternative concepts is evolving as well, such as browser games, casual games, or mobile/pervasive games. One particularly promising field of innovation in computer-based entertainment is interactive storytelling (IS). IS systems present evolving narratives that can be influenced, in real-time, by the user.^{1,2} The basic idea of IS is that intelligent software dynamically synthesizes preauthored story elements (e.g., involving characters and their mutual relationships, events, and locations) with individual user input, allowing users to cocreate a unique story. By allowing users to exert a global influence on a developing storyline, IS is distinct from conventional video games. Although video games usually allow users to manipulate local events, character behaviors, and virtual environments, the storyline itself remains linear, and often fixed. IS' vision, in contrast, is more similar to Star Trek's[®] Holodeck,³ where users generate novel, one-of-a-kind

entertainment experiences that combine characteristics of advanced video games, virtual reality, and/or (virtualized) drama.⁴

Although the vision of IS is appealing, its development is still in its infancy. Only few IS prototypes exist, and many possibilities to design entertaining experiences need yet be explored.⁵ The current research zooms in on a design choice that may be particularly relevant to IS environments, namely how to involve players psychologically in the story development. In most video games, players are assigned the role of a protagonist: a local agent focusing on his/her own behavior and immediate surroundings. In IS, however, perhaps, a more natural role would be that of a global influencer: a writer, director, or mediator whose main goal is to make the developing story worthwhile. Such a global role could potentially optimize control-related entertainment experiences, such as autonomy, effectance, and flow.⁵ On the other hand, it could hamper the more immersive entertainment experiences that go hand in hand with playing a protagonist: presence, character identification, and affect.⁶

The present study compares experiences of IS users in a local versus global mode. Employing a previously developed array^{5,7} of user experience measures derived from

¹Center for Advanced Media Research Amsterdam (CAMErA), VU University Amsterdam, Amsterdam, The Netherlands

²Department of Communication Science, VU University Amsterdam, Amsterdam, The Netherlands.

³University of Mannheim, Mannheim, Germany.

⁴Department of Journalism and Communication Research, Hannover University of Music, Drama, and Media, Hannover, Germany.

⁵School of Computing, Teesside University, England.

entertainment theory,⁸ it aims to discover whether different ways of involving users in interactive narratives cause systematically different experiences.

User Roles in Interactive Stories: Actor versus Ghost mode

Thus far, IS developers emulated common practice in video games by arranging user experiences around the role of a protagonist. For instance, much-hailed IS system *Façade*⁹ situates users as a guest in the midst of a conflict between two autonomous characters. The few video games that include IS elements (e.g., “*Fahrenheit*” and “*Heavy Rain*”) also have user-control central game characters. IS prototype *EmoEmma*¹⁰ introduces a different approach, labeled ‘ghost mode’. Here, users do not play a story character, but observe and influence ongoing story events by, for example, moving or adding objects or giving commands to virtual actors. Like ghosts, users move freely through the story environment and interact with its elements. Ghost mode therefore comes close to being a global influencer: a story cocreator who takes charge of story developments without ties to an individual protagonist.

Theoretically, such different ways to involve users in IS are likely to elicit different user experiences. Video game identification research^{11,12} suggests that IS based on character control should drive users’ sense of entertainment through simulated self-experiences of being a character, living in a story world, and feeling characters’ emotions. These simulated self-experiences, in turn, likely elicit entertainment experiences such as character identification, presence, and affect, that is, assuming identity, location, and inner states of a character.¹³ In contrast, IS based on story control may elicit user experiences dominated by a sense of control or autonomy,¹⁴ as well as effectance and flow,⁷ since this global role, along with its means of interaction, helps IS players’ pursue their goal of creating a worthwhile story, and thus facilitates perceptions of self-sufficiency and task-oriented attention.

The only empirical study conducted thus far on user responses to different user modes in IS compared usability-oriented outcomes for actor and ghost mode *Emo Emma* players.¹⁰ It found that users covered far larger distances within the virtual story environment in ghost mode, supporting the assumption of autonomy as a key dimension of the user experience in this design approach.

The present study goes beyond measuring usability and player behaviors—it instead compares entertainment experiences of users of *Emo Emma* in both local and global modes, employing a pre-established measurement battery^{5,7} covering a broad range of measures derived from entertainment theory.⁸ Based on the arguments above, we expect actor mode to better facilitate experiences of presence, character identification, and affect, whereas ghost mode will better facilitate experiences of autonomy, effectance, and flow. Overall enjoyment, as well as theoretically established drivers of media enjoyment—curiosity, suspense, aesthetic pleasantness, system usability, user satisfaction, character believability, and pride—are tested in an exploratory fashion. In addition, we will test gender differences in entertainment experiences. Prior research suggests that for male players, the sense of control facilitated by ghost mode might be more appealing,^{15,16} whereas female players might be more attracted to the sense of communicative involvement facilitated by the actor mode.¹⁷

Method

An experiment compared players’ responses to an interactive story played in an actor versus ghost mode. A total of 34 university students (11 men, 23 women; average age $M=22.0$ years, $SD=1.92$ years) with a low-to-moderate degree of computer game literacy ($M=1.71$, $SD=0.84$ on a scale from 1 to 3) participated in the study. Comparisons between playing modes were implemented within subjects. The order in which participants interacted in the actor-versus-ghost mode was balanced, counteracting possible order effects.

The IS stimulus system was *Emo Emma*, an advanced prototype developed at the Teesside University, UK.¹ Based on the classic French novel *Madam Bovary* by Gustave Flaubert, this system allows users to engage in a romantic conversation between two characters, situated in a mansion. In the actor mode, users play the role of Rodolphe Boulanger (Emma Bovary’s admirer), who intends to express his romantic feelings toward Emma, in spite of her marriage. In the ghost mode, players are bodiless and invisible in the virtual environment, can observe the ongoing conversation among Rodolphe and Emma, explore the house freely, manipulate objects, and influence the behavior of either character. In both usage modes, the scene lasts between 4 and 6 minutes. Mouse, keyboard, and vocal commands serve as user inputs.

Upon arrival in the laboratory, participants received a short training in interacting with *Emo Emma* for about 5 minutes. Next, half of the participants were first exposed to an IS sequence in the actor mode, whereas the other half was first exposed to the ghost mode. Subsequently, participants completed a questionnaire consisting of 14 previously developed and validated^{5,7} measures that capture a broad range of drivers of media enjoyment: curiosity, suspense, flow, aesthetic pleasantness, enjoyment, affect, role adoption, system usability, user satisfaction, character believability, effectance, presence, autonomy, and pride. Experience dimensions were measured on a 5-point Likert scale using two to five items each. Internal consistency scores for all scales (Table 1) were acceptable, except for negative affect whose two items showed only a weak-to-moderate correlation, and suspense. Subsequently, participants proceeded to interact with *Emo Emma* in the opposite (ghost or actor) mode. Then, they completed the questionnaire again. Finally, participants received 20 EUR as compensation, were debriefed, and dismissed.

Results

Within-subject comparison of self-reported experiences between playing in the actor-versus-ghost mode using paired sample *t*-tests reveals that user experiences indeed differ between playing modes (see Table 1). When playing in the ghost mode, participants reported significantly higher levels of effectance, and marginally higher levels of autonomy and flow. These results confirm that the ghost mode facilitates greater degrees of empowerment to pursue storytelling goals. Pride was also significantly higher in the ghost mode. Providing players with better means to pursue their goals seems to improve the likelihood they experience a sense of accomplishment. More unexpectedly, curiosity was also marginally higher in the ghost mode. Apparently, by offering a (nearly) constraint-free mode of interaction, the ghost mode triggered more user interest in the consequences of actions. Finally, user

TABLE 1. COMPARISON OF USER RATINGS BETWEEN ACTOR MODE AND GHOST MODE

	Internal consistency/ reliability (first/second assessment)	Actor mode		Ghost mode		<i>p</i>
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
System usability	$\alpha=0.61/0.70$	4.11	0.80	4.22	0.65	0.28
User satisfaction	n/a	3.09	1.06	3.35	0.98	0.08 ^a
Presence	$\alpha=0.79/0.76$	3.26	0.85	3.10	1.01	0.22
Character believability	n/a	3.12	0.98	3.06	1.04	0.80
Effectance	$r=0.82/0.88$	2.24	0.95	2.88	1.27	0.007 ^b
Autonomy	$\alpha=0.84/0.87$	2.17	0.85	2.47	1.08	0.05 ^a
Curiosity	$\alpha=0.72/0.82$	3.59	0.80	3.86	0.56	0.05 ^a
Suspense	$\alpha=0.56/0.56$	3.61	0.61	3.49	0.80	0.37
Flow	$\alpha=0.62/0.71$	3.09	0.71	3.31	0.79	0.09 ^a
Aesthetic pleasantness	$\alpha=0.81/0.87$	2.33	0.91	2.44	0.94	0.34
Pride	$\alpha=0.87/0.88$	2.21	0.84	3.01	1.10	0.001 ^b
Enjoyment	$r=0.86/0.94$	3.68	1.10	3.69	0.95	0.91
Affect: positive	$\alpha=0.86/0.84$	3.00	0.95	3.17	0.91	0.14
Affect: negative	$r=0.36/0.37$	1.97	0.82	1.88	0.65	0.33
Character identification	n/a	2.76	1.14	2.63	1.02	0.34

^aMarginal difference at $p < 0.1$.

^bSignificant difference at $p < 0.05$.

Reliabilities of scales with only two items were assessed using Pearson's r correlations. No reliability (n/a) is stated for one-item measurements.

satisfaction was marginally higher in the ghost mode, indicating that it better met players' prior expectations about IS experiences.

Playing in the actor mode resulted in relatively low experience ratings on the mentioned dimensions, which suggests that playing a predefined role within the narrative yields fewer perceptions of control and successful implementation of intentions in users. Converse to our expectations, the actor mode did not yield higher scores on presence, character identification, and affect. This contradicts prior research on video game identification^{10,11} and indicates that perhaps the immersive qualities of the current system did not (yet) elicit perceptions of melting with a character.

An analysis of gender differences in user experiences using a repeated measures ANOVA showed that while male users overall enjoyed the ghost mode more than the actor mode ($M=3.94$, $SD=0.91$ vs. $M=3.74$, $SD=0.90$), for female users it was the other way around ($M=3.18$, $SD=1.29$ vs. $M=3.59$, $SD=0.92$; $F(1, 32)=4.57$, $p=0.04$). This coincides with the notion that men prefer the sense of control provided by the ghost mode, while women prefer the communicative involvement provided by the actor mode. This notion is not backed up by more specific user experience measurements; none revealed gender differences.

Discussion

The current study tested whether different player modes (actor mode, exerting local influence versus ghost mode, and exerting global influence) yield different types of user experiences (senses of immersion vs. control) in IS environments.

As expected, control-related experiences such as autonomy, effectance, and flow were higher in the ghost mode. Also, the ghost mode triggered a higher sense of accomplishment, user satisfaction, and curiosity. Contrary to our expectations, playing in the actor mode did not improve involvement-related experiences such as presence, character identification, and affect.

We conclude that participants responded positively to the greater level of goal-oriented control enabled by the ghost mode. In contrast, playing in the actor mode seems to come with perceived constraints with respect to storytelling goals. The ghost mode offers more freedom and a broader arsenal of possible user interventions that can be employed to exert a more global influence. In addition, however, the ghost mode seems to offer a detachment from story characters that may serve to take away psychological constraints to pursue the storytelling goal. As one participant put it, "It was easier to play the ghost, because giving Rodolphe tips about what to say to her was easier for me than actually say these things to Emma in a convincing way." The combined benefits of control, freedom, and character detachment may have contributed to males' greater enjoyment of the ghost mode; female participants in contrast preferred the more socially involving experience provided by the actor mode.

The present research implies that IS environments may face a specific challenge with respect to user experiences, that is, allowing users to exert global control over story developments while keeping them immersed in story developments. One way to face this challenge is by producing extremely convincing social interactions with digital agents, as well as presence-evoking environments, to maintain suspension of disbelief despite full story control. Surely, creating such environments poses an AI challenge for many forms of digital entertainment, but for IS, where linear storylines and constraints to user autonomy are thrown overboard, it might be particularly hard.

Given the infant state of IS, in the near future, most gains can be expected by focusing on an improvement of the experience of global control, such as in Emo Emma's ghost mode. Such an improvement would make IS environments stand out from other digital entertainment environments (e.g., video games). Experiences such as freedom,¹⁰ autonomy,¹⁴ and successful implementation of one's own intentions¹⁸ are established drivers of interactive enjoyment, and could provide future IS environments with a unique appeal.

From a cyberpsychology perspective, our research implies that technological drivers can have a relevant impact on IS entertainment experiences. Future conceptual work could focus on how technological and content-related factors (e.g., entertainment vs. education-oriented IS environments) interact in shaping users' experiences.

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Address correspondence to:

Christian Roth
Center for Advanced Media Research Amsterdam (CAMErA)
VU University Amsterdam
De Boelelaan 1105
Amsterdam 1081 HV
The Netherlands

E-mail: roth@spieleforschung.de